

APPLIED SCIENCE

How They Found the Bomb

The 2,200-man Navy task force that carried out the Great H-Bomb Hunt near the Spanish coastal town of Palomares more than earned its headlines. But the men who conducted an equally productive part of the search were an unheralded group of scientists and technicians in far-off New Mexico.

Soon after the January 17 collision between a nuke-carrying B-52 and its KC-135 tanker over Spain, a desperate Defense Department turned for help to the Sandia Laboratory in Albuquerque, which conducts bomb-electronics research for the AEC. Sandia scientists promptly requested all available accident data from the task force. With other experts, they pored over interviews with surviving B-52 crew members and witnesses on the ground; they studied Air Force wind-velocity records and the ballistic characteristics and impact points of the three recovered H-bombs. By feeding complex equations into computers, they projected trajectories backward from the impact points and established the precise location of the collision—the point from which the missing bomb began its descent.

Simulated Breakup. Sandia's next step, reports its house organ, Lab News, was to work out what had happened to the lost bomb. Had it broken apart in the air, or come down intact? Had it fallen freely to the land below, or been carried far out to sea on its parachute? To simulate a mid-air breakup, the scientists dropped bomb parts from a high-flying plane at White Sands Missile Range, then photographed the craters made by the parts as they hit the ground. The pictures were rushed to Palomares, where searchers looked in vain for similar patterns on Spanish soil.

Back at their computers, other scientists of Sandia determined that the radioactive contamination of Spanish soil had been caused entirely by the two recovered bombs that had broken apart on impact. Had another bomb shattered on land, the level of radio-

activity would have been higher. Thus the scientists assumed that either the missing bomb had not broken apart on hitting land, or it had fallen into the sea. Further ballistics analysis and wind data enabled the Sandia computers eventually to plot the probable trajectory of the missing bomb and locate where it had hit the water. Their calculations tended to confirm the story of Spanish Fisherman Francisco Simo y Orts, who had reported to skeptical task-force officials that a "stout man" swinging from a parachute had hit the water only about 75 yds. from his boat, five miles off Palomares.

Precarious Perch. Late in February, when the final information from Palomares had been processed by the computers, Sandia scientists traced a square on a Spanish coastal chart and said, "Tell *Alvin* (the deep-diving research submarine that eventually found the bomb) to look here." Three weeks later, when the little sub finally located the missing bomb—2,500 feet below the surface, still shrouded in its parachute and perched precariously on a 70° slope—it was 1,200 yards from the final coordinates calculated in a laboratory over 5,000 miles away.

